Methods: Records of all patients undergoing treatment for NTOS at our center were reviewed. Patient demographics and co-morbidities were recorded. End-points included symptomatic relief, peri-operative adjunctive procedures, functional outcome, and employment continuity.

Results: From 1988-2008, 26 patients were operated upon for NTOS. Hallmarks of the diagnosis in operated patients included symptom duration less than one year and positive Roos test. Patients receiving disability and those with cervical spine pathology were not considered for surgery. Mean patient age was 39.2 years (range, 14-60 years) with a mean follow-up of 104.4 months. Eleven patients (42.3%) engaged in pre-operative physical therapy programs. Seven of nine patients (26.9%) received adjunctive peri-procedural scalene block with temporary symptom relief. All patients underwent thoracic outlet decompression by either first rib resection (18 total: 8 [44%] transaxillary and 10 [66%] supraclavicular), cervical rib resection (6 [26.1%]), and/or scalenectomy (12 [46.2%]). Of the 22 patients available for follow-up, six patients (27.3%) have required continued postoperative narcotic analgesics. Sixteen patients (72.7%) returned to work and reported being at an equivalent or better functional outcome than their pre-operative status.

Conclusions: Durable long-term functional outcomes can be achieved predicated on a highly selective approach to the surgical management of patients with NTOS. A majority of operated patients will not require adjunctive procedures or chronic narcotic utilization. Patients who undergo surgery can expect to return to work with little or no functional impairment.

The Effect of Surgical Technique on the Midterm Functional Outcome of Brachiocephalic Arteriovenous Fistulas: One Incision vs Two Incisions

Costanza M, Stein J, DiRocco J, Ehsani-Chimeh N, Amankwah K, Gahtan V

Objectives: Surgery to create a brachiocephalic arteriovenous fistula (BCAF) can be performed through one transverse incision distal to the antecubital fossa or two parallel incisions on the upper arm, proximal to the antecubital fossa. The prevailing wisdom holds that the choice of one or two incisions should not affect fistula outcome; however, this assumption has never been formally evaluated. We compared the functional patency of BCAF that were created using one vs. two incisions.

Methods: We reviewed the records of all patients who had BCAF surgery by our division over the last five years. The choice of one or two incisions depended on surgeon preference. Patients who had BCAF surgery but never started dialysis were excluded. Functional patency was defined as the time period during which the fistula was used for hemodialysis. Cumulative functional patency was the sum of primary, assisted, and secondary functional patency and the two groups were compared using life table analysis.

Results: We constructed 126 BCAF; 11 patients have yet to start dialysis, leaving 115 patients as the study population. A total of 50 patients had one incision and 65 patients had two incisions. At one month follow-up, all fistulas in both groups were clinically patent. The fistula was never used for dialysis in 15 (30%) patients with one incision and in 18 (27%) patients with two incisions. In both groups, the most common reason for abandonment was non-maturation. By life table analysis (Fig), fistulas constructed using two incisions had a significantly longer median cumulative functional patency than fistulas constructed using one incision (26 ± 1.1 months vs. 9 ± 1.3 months; $P < .005$).

Conclusions: This non-randomized series suggests that surgical technique has an effect on fistula function. BCAF constructed using two incisions demonstrated superior functional patency compared with BCAF constructed using one incision. The two-incision approach places the arteriovenous anastomosis more proximally on the upper arm compared with the one-incision approach in which the anastomosis is distal to the antecubital fossa. We speculate that the quality of the artery and vein at this more proximal location could explain the better durability of the two-incision technique.

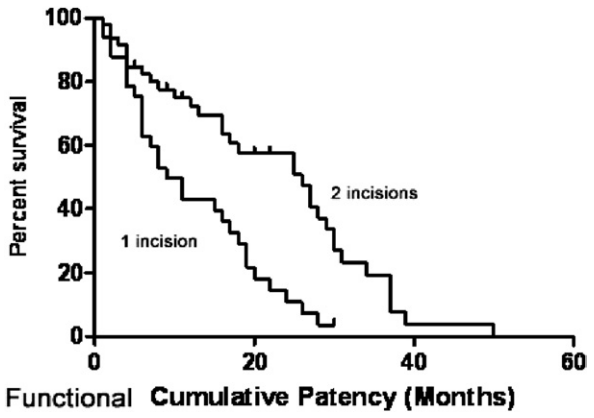

Fig. Cumulative patency for brachiocephalic AV fistulas.

Declotting of Arteriovenous Hemodialysis Acssess: A Comparison of Percutaneous Mechanical Thrombectomy and Angioplasty versus Open Thrombectomy

Nahmias JT, Schanzer A, Messina LM, Eslami MH

Objectives: Maintaining patency of arteriovenous hemodialysis access (AVHA) in more than 25,000 patients is very costly. This study was set to compare the length of stay (LOS), hospital charges, and secondary patency rates of percutaneous mechanical thrombectomy (PMTA) versus open thrombectomy (OT).

Methods: A retrospective chart review analysis of a single institution AVHA thrombectomy cases; 77 OT and 36 PMTA cases from 2002 to 2008 were reviewed. We compared the mean and median LOS, mean and median secondary patency rates, and mean hospital charges. Statistical analyses were performed using t test and data was significant if $P < .05$.

Results: OT had a mean LOS of five days, mean hospital charges of $30,750, and a mean secondary patency of 70 days. PMTA had a mean LOS of two days, mean hospital charges of $30,006, and a mean secondary patency of 73 days.

Conclusions: There is a higher mean secondary patency rate and lower hospital charges for PMTA. Additionally, PMTA had a statistically significant lower mean LOS compared with OT ($P = .0002$). Given the significant less LOS, less charges, and higher patency rates, we concluded that PMTA is a superior option for AVHA thrombectomy. Cost effectiveness would require a multi-center prospective randomized trial.

The Effect of Immunosuppression on Lower Extremity Arterial Bypass Outcomes

Grisafi JL, Dadachanji C, Rahbar R, Muluk SC, Benckart DH

Objectives: Myointimal hyperplasia is a pathologic result of the body's natural inflammatory response to blood vessel injury and a leading cause of early peripheral arterial bypass failure. Since immunosuppressive agents are known to abate inflammation, we hypothesized superior outcome of lower extremity bypass in subjects of renal transplantation compared with the hemodialysis population.

Methods: The vascular surgery registry at a single tertiary care center was retrospectively reviewed to identify recipients of lower extremity bypass procedures. All patients with a history of renal transplantation (RT group) were selected for analysis. The indication of acute arterial occlusion resulted in exclusion from analysis. Bypass patients with dialysis dependent renal failure (RF group) were randomly selected to provide a matched control cohort. Amputation-free survival was the primary endpoint.

Results: See Table for demographics and results. Vascular reconstruction for chronic peripheral vascular disease (PVD) yielded an amputation-free survival rate of 80% at one year for the RF group compared with only 22% in the RT group ($P = .02$). There was no statistically significant difference between the groups in mortality at 30 days and one year, indication for operation, or comorbid conditions. Indications for operation included severe claudication ($n = 1$), rest pain ($n = 1$), and tissue loss ($n = 17$). Interestingly, vascular reconstruction on the extremity ipsilateral to the allograft was required in 67% of the transplant patients; however, this observation was not statistically significant.

Conclusions: The results of this study suggest a deleterious effect of immunosuppression on outcome of lower extremity bypass procedures at the dosing levels required to prevent allograft rejection. This finding, which has been scarcely reported, underscores the importance of pre-transplant PVD screening and timely reconstruction when clinically indicated.

Table. Demographics and results

	RT (n = 9)	*RF (n = 10)*	P *value*
Mean age	54 years	66 years	.04
DM	89%	90%	1.0
HTN	100%	100%	1.0
Smoker	0%	44%	.08
BMI	27.3	26.4	.78
Prosthetic	11%	40%	.3
Amputation-free survival	22%	80%	.02

BMI, Body mass index; *DM,* diabetes mellitus; *HTN,* hypertension.

Multilevel Versus Isolated Tibial Interventions for Critical Limb Ischemia

Fernandez N, Marone L, Rhee R, Leers S, Makaroun MS, Chaer R

Objectives: Endovascular interventions for critical limb ischemia (CLI) continue to have variable outcomes. The purpose of this study is to determine the anatomic predictors of failure for tibial interventions.